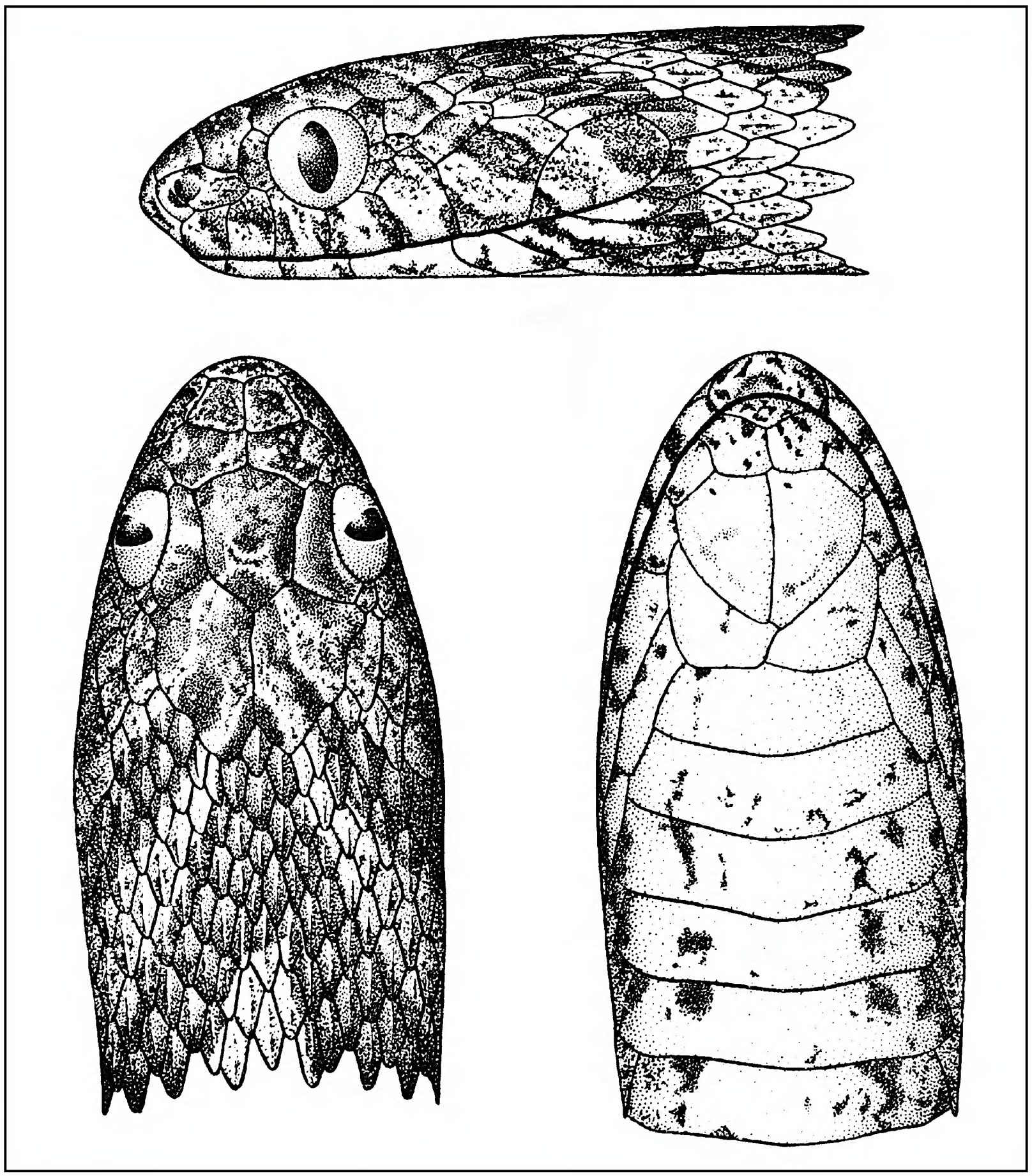
BULLETIN
of the
Chicago Herpetological Society

Volume 45, Number 6
June 2010



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The *Bulletin of the Chicago Herpetological Society* (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society, 2430 N. Cannon Drive, Chicago IL 60614. Periodicals postage paid at Chicago IL. **Postmaster:** Send address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago IL 60614.

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Bull. Chicago Herp. Soc. 45(6):97-106, 2010

A Critique of the Analysis Used to Predict the Climate Space of the Burmese Python in the United States by Rodda et al. (2008, 2009) and Reed and Rodda (2009)

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Summary

The map and data set that were used by Rodda et al. (2008, 2009) were also used in the USGS report by Reed and Rodda (2009). The map created to illustrate the range of *Python molurus* sensu lato [now *Python molurus* and *Python bivittatus*] is novel, and significantly expands the range in several areas. In the weather station data set, 29 of 88 records (33%) that can be referred exclusively to *P. bivittatus* are extralimital. Eleven of 50 records (22%) that refer to weather stations exclusively in the range of *P. molurus* are extralimital to the range of that species. Of the total 149 records in the data set, 43 records (29%) refer to weather stations that lie outside the range of either species. We question the validity of choosing weather stations on the basis of published altitude records for the species. We conclude that all analyses, risk assessments, predictions, and conclusions based on this map and data set in Rodda et al. (2008, 2009) and Reed and Rodda (2009) are invalid.

Introduction

Rodda et al. (2008, 2009) suggested that the climate of the southern third of the continental U.S. would be favorable for the establishment of the Burmese python, based on establishment risk and climate matching analyses. Subsequent United States Geological Survey (USGS) press releases and media interviews of the authors stated that, based on this paper, there was a strong possibility that Burmese pythons would invade and establish in the U.S. from Washington, D.C., to San Francisco. Despite various criticisms of the paper (Barker and Barker, 2008a, 2008b, 2009; Pyron et al., 2008), the results and conclusions were used directly in the report of Reed and Rodda (2009) funded by U.S. Fish and Wildlife Service and National Park Service and published by USGS.

The establishment risk assessment is based on the climate matching, which, in turn, is based on the estimate of climate space for what are now considered to be two distinct species, *Python molurus* and *Python bivittatus*. Climate space is then based on climate data obtained from weather stations scattered throughout the natural distribution of the two python species. This data is compiled in a data set on which all of these analyses in Rodda et al. (2008, 2009) and Reed and Rodda (2009) are based. This data set is not included in either publication, and was not made available to us. Our requests to the authors for the data were unanswered, thus preventing us from making an independent, objective evaluation of the analyses.

In early 2010 we received a copy of a data set that was distributed by Rodda to a private individual in June 2008. This file includes the data on which the climate space prediction, climate matching, and establishment risk assessment for *Python molurus*, sensu lato, is based in Rodda et al. (2008). More recently we received a printed copy of the data set from Reed and Rodda (2009) that was included in response to a Freedom of Information Act request made to USGS by the U.S. Association of Reptile Keepers. The two data sets appear to be identical. We have examined the data and are able to make the following comments.

The data set is flawed. One obvious problem is that the authors combined data for *molurus* and *bivittatus*. At the time of the release of the first paper, Rodda et al. (2008), the two taxa were considered as subspecies of *Python molurus*, the Asian rock python. However, Barker and Barker (2008b) criticized combining the two taxa as ill-advised because *bivittatus* was a well-recognized distinct taxon with a large discrete range; it alone was the actual purpose for and should have been the sole focus of that first paper. It appeared that *P. m. molurus* was included in the analysis for little reason other than to increase the area in the U.S. that the climate match would deem habitable.

This error of the analysis became doubly apparent when in the period between the posting of Rodda et al. (2008) and the publication of the USGS report (i.e., Reed and Rodda, 2009), a paper was published by Jacobs et al. (2009) recognizing the taxon *bivittatus* as a full species, *Python bivittatus*. This alone invalidates all analyses of *Python molurus* sensu lato in Rodda et al. (2008) and, more importantly, the USGS report.

The second problem is that the data set is only loosely based on a poorly researched and drawn map meant to illustrate the range of *P. molurus* and *P. bivittatus*; that map first appeared in Rodda et al. (2008) and was used again in the USGS report.

The map

Figure 1 on the following page is a redrawn version of the map showing the distribution of *Python molurus* sensu lato that appeared as Figure 1 in Rodda et al. (2008). This map is a novel depiction of the distribution of *P. molurus* and *P. bivittatus* in that it includes a number of substantial range increases not shown on maps published prior to 2008. This is not necessarily surprising, since earlier maps showing the distribution of *molurus* and *bivittatus* were illustrations to accompany the rather generic descriptions of the natural ranges offered by a variety of sources, including Wall (1912, 1921), Smith (1943), Daniel (1983), Luxmoore et al. (1988), Khan (2006), and others. In all of these, range was delimited by international and provincial boundaries; there was minimal or no reference to actual published localities or suitable elevations based on localities.

However, because the map of Rodda et al. (2008) was cre-

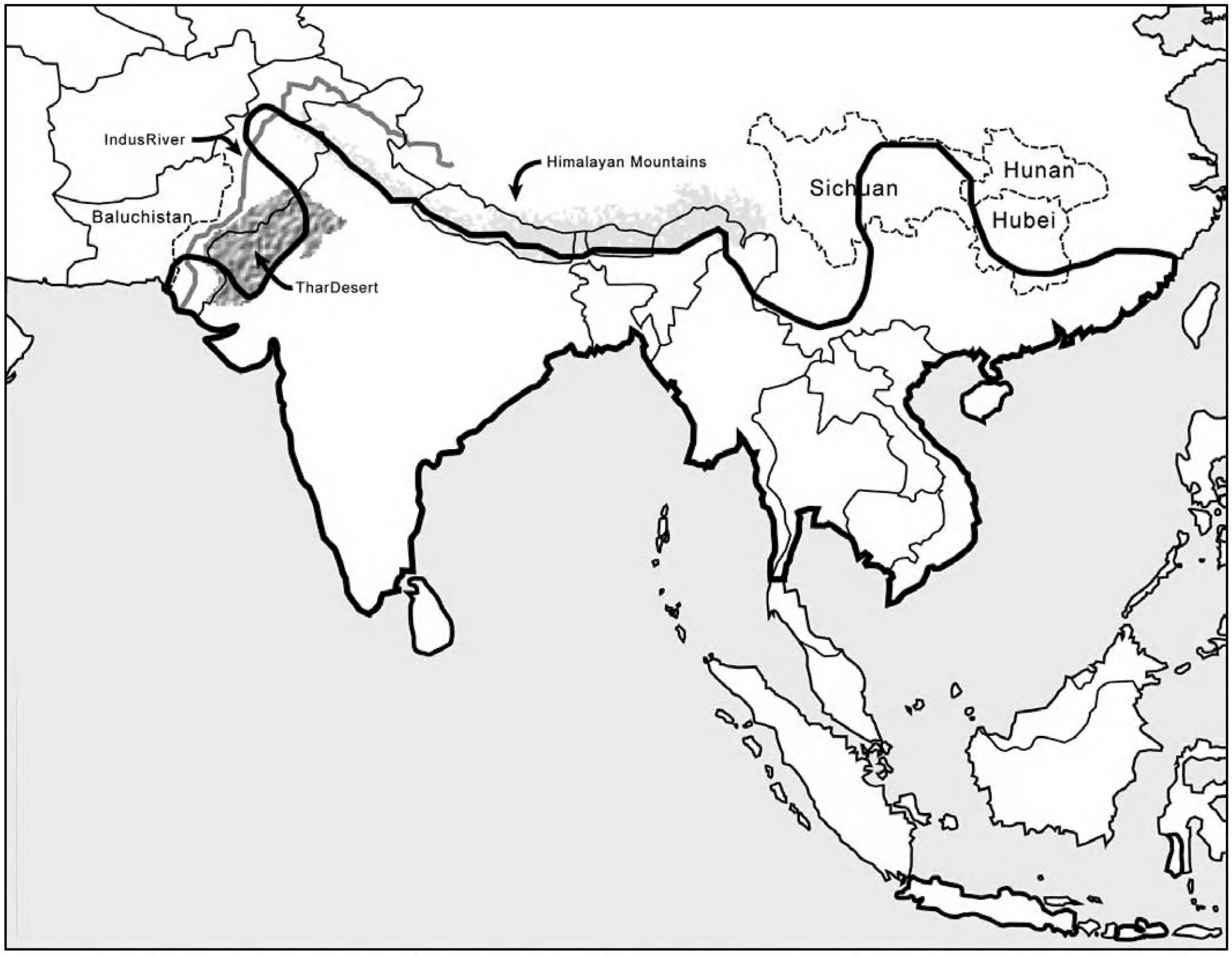

Figure 1. Range of *Python molurus* sensu lato, modified from Rodda et al. (2008) and Reed and Rodda (2009). The only modification we have made is to identify the states, provinces, and geographic features that relied on color in the legend of their version. The heavy outline denotes their putative range limits.

ated to properly locate the weather stations that provide the data on which all analyses are based, it seems especially important that every effort should have been made to create the most accurate and detailed map possible. When and where exact locality data was unavailable, a conservative approach would have been the best and most defendable action.

The boundaries of much of the mainland distributions of *P. molurus* and *P. bivittatus* are well defined, being the Arabian Sea, Bay of Bengal, South China Sea, Thar Desert, and Himalayan Mountains. The insular distributions also are generally agreed upon, with *P. bivittatus* found on four islands in Indonesia, and in China on Hainan, Hong Kong and associated small islands, and Queymoy Island and small islands in the Kinmen Archipelago. The presence of *P. molurus* in Sri Lanka is well documented.

There are two general areas where the creator of a range map for *P. molurus* could take many liberties in illustrating the periphery of the distribution, and one larger area in the case of *P. bivittatus*. We find all three areas in the map of Rodda et al. (2008) to be exaggerated in a manner as to incorporate into the map areas of low precipitation or low temperatures that likely are extralimital to the range of the species. The authors also included areas of unsuitably high elevations in the data set, to further incorporate cool climate data into the analyses, the effect being to exaggerate the climate match.

The areas of contact and sympatry between the two species are not well described in the literature. It is not known how much, if any, overlap exists between the two in Bangladesh, Assam, the terai of southern Nepal and Gangetic Plains of northern India; there seems to be complete agreement among authors that one or both of the species are found in those areas, but which species is where has yet to be untangled (Kock and Schröder, 1981; O'Shea, 1998; Whitaker, pers. com.). However, the type or location of the zone of contact between the taxa would not affect the climate match in Rodda et al. (2008).

The map of the range of *Python molurus*

The first of two areas where the range of *P. molurus* is exaggerated is the area southwest of the Thar Desert where the range of *P. molurus* centers around the Indus River delta in the Sindh Province of southern Pakistan. The second area is the northernmost periphery of the range, referring to the few known localities in the state of Jammu and Kashmir, India, and adjacent Punjab Province in Pakistan. Both of these general areas repre-

sent the extreme limits of the natural distribution of the species, as well as the most extreme climatic conditions in which the species can be found. In both areas, pythons are found in scattered small populations, restricted to areas of microclimate and habitat not necessarily typical of the overall area (Minton, 1966; Sharma, 1972; Khan, 2006).

Minton (1966) and Khan (2002, 2006) stated that pythons in the Sindh were uncommon, and found at scattered small localities closely associated with the Indus River delta and lower valley, mostly found along the river in areas of cane and brush. Whitaker (1993) stated that pythons were extremely rare, approaching extinction, throughout Pakistan. In the Sindh, the species shows a strong association with permanent water, including man-made reservoirs and irrigation canals (Minton, 1966; Khan, 2006). The species is more commonly found east of the Indus River, and the range extends up the river valley north to the Nawabshah District (Minton, 1966; Khan, 2006). Khan (2002) shows three localities on his map for *P. molurus* in southern Sindh; one in the vicinity of Hyderabad, another in the vicinity of Mirpur Kas, and a third along the margin of the desert in the vicinity of southwestern Thar Parkar District. The map of Khan (2006) shows two localities in the Sindh, one in southwestern Thar Parkar, and the other in the vicinity of Nawabshah District.

Immediately to the west of Sindh Province, along the eastern Baluchistan border, the species may occur along the lower reaches of the Hab River; Minton (1966) stated he received reliable reports of *P. molurus* at Dureji, a locality about 50 km from the coast along the Hab River, but was unable to obtain specimens from that locality.

In Figure 1, the area in the Sindh that is demarcated as range exaggerates what is probable habitat for *P. molurus*. We note that the map in Figure 1 excludes Thar Parkar District without explanation. The map of Rodda et al. (2008) includes as range all of southern Sindh, north to include the districts of Dadu, Naushahro Feroze, and Khairpur, all north of the district of Nawabshah. We can find no record of pythons from those districts. It also includes eastern Khairpur, eastern Sanghar, Umerkot, and northeastern Thar Parkar; this area where the southwestern Thar Desert extends into southern Pakistan is sandy desert with dunes—we are unable to locate records of pythons from this harsh, dry area. We note that Ghalib et al. (undated) state that *P. molurus* is found in the desert area of Thar Parkar; Thar Parkar District includes the transitional southern margin of the vast Thar Desert. Khan (2006) includes *P. molurus* on the list of herpetofauna from the Thar Desert; although this seems to conflict with the description of python habitat provided elsewhere in that publication; he also states that there are scattered isolated oases in the Thar Desert with permanent or semi-permanent water and dense forest or scrub. It seems likely that these isolated and scattered mesic refugia provide the only habitat for pythons, rather than the more xeric sand dune areas.

The second problematic area mapped for *P. molurus* is at the northern limit of the distribution. The northernmost known localities of *P. molurus* are those reported by Sharma (1972) and Sharma and Sharma (1977) in the region of Jammu Province,

Figure 2. The shaded area denotes the distribution of the Indian python, *Python molurus*.

India. These localities are in protected valleys at 600–800 m elevation in five small districts—Poonch, Rajouri, Jammu, Udhampur and Kathua. The northernmost locality is the Poonch [Punch] Valley in the drainage of the Jhelum River; Sharma (1972) reported that pythons were uncommon at this northernmost locale. The Chenab River provides drainage for the valleys in Jammu, Rajouri and Udhampur districts. The Kathua Valley is drained by the Ravi River. The only locality records from northern Pakistan we can locate are a locality on the Chenab River in Punjab Province in the vicinity of Gujranwala District (Khan, 2002, 2006) and a second locality in the drainage of the Ravi River in the vicinity of Lahore (Khan, 2002).

In Figure 2, we have mapped the range of *P. molurus* in this area as following a similar elevation from western Nepal, skirting the rise of the Tibetan Plateau north through Himachal Pradesh and into Jammu Province, bounded on the west by the northern reaches of the Thar Desert, identified on some maps as the Great Indian Desert. The distribution reaches its northern maximum in the lower reaches of the Poonch valley in the Poonch District. There our map shows the distribution to follow the drainages of three rivers to the southwest. The northern river is the Jhelum River, the middle is the Chenab River, and the southern of the three is the Ravi River. We have illustrated the distribution to follow the drainages of these three rivers to their junctures, considerably farther south than is supported by reported localities. The limits to the territories where pythons might be encountered along these rivers are not reported, but Khan (2006) states that pythons may be moved along these drainages by flood waters. We are not aware of pythons occur-

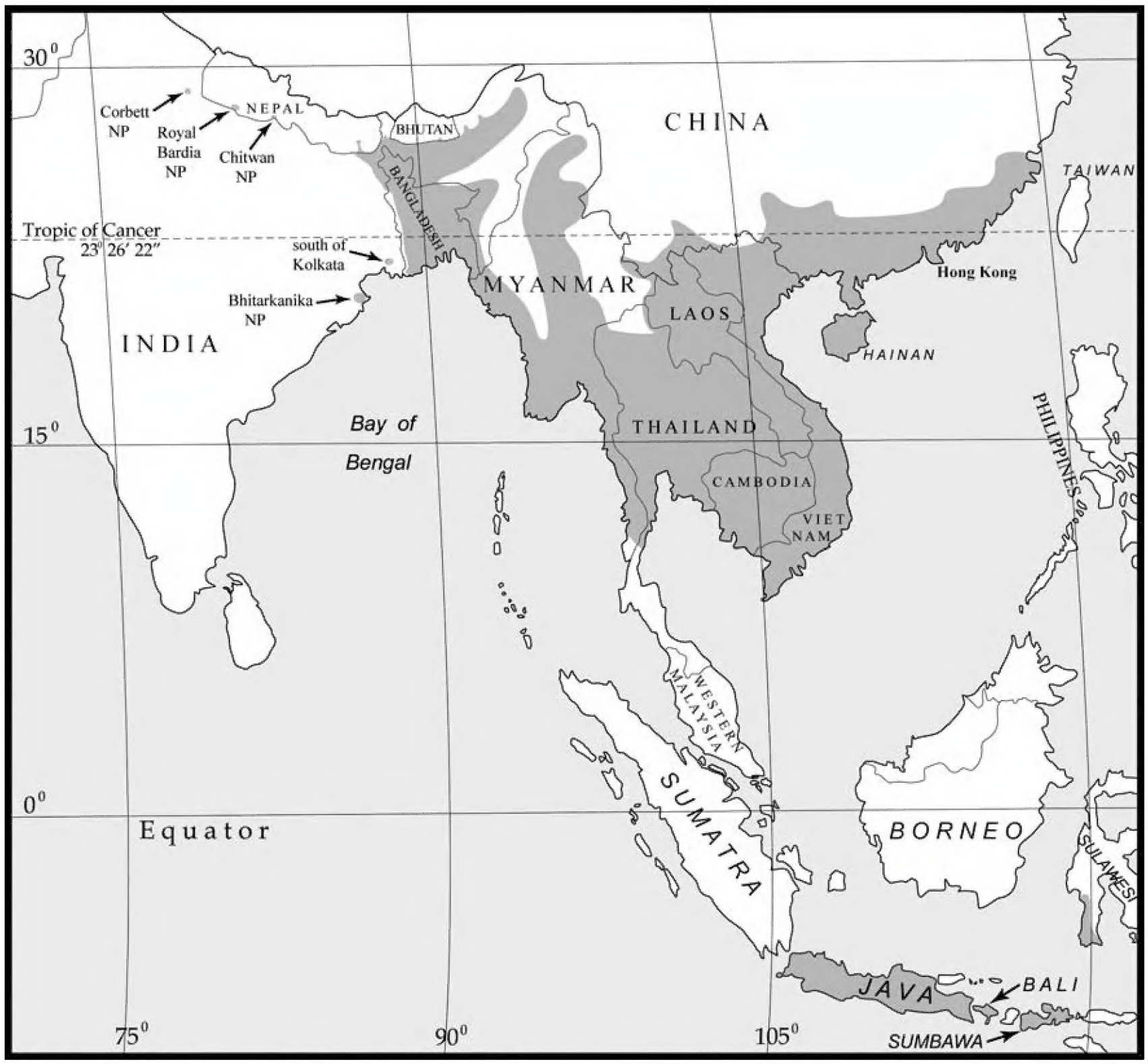

Figure 3. The shaded area denotes the distribution of the Burmese python, *Python bivittatus*.

ring in the lower reaches of the Sutlej River, also a significant southern tributary of the Chenab River, but populations of pythons may exist along the upper drainages of this watercourse in India.

In Figure 1, the northwestern range of *P. molurus* is illustrated as projecting northwest from Jammu Province in India into Pakistan across the northern reaches of Punjab Province, along the southern boundary of the Pakistan Capital Territory, and on across the province of Khyber-Pakhtunkhwa, including the capital of Peshawar, to the northern Tribal Areas along the Afghanistan border. This is a dramatic increase in area of the distribution of the species as reported in the literature and previously mapped in all accounts. *Python molurus* is unknown in the province of Khyber-Pakhtunkhwa and the Tribal Areas.

Our map of the distribution of *P. molurus* (Figure 2) shows more conservative estimates of the python's range both in southern Pakistan and in northern Pakistan. Our boundaries in those areas are based on the few published localities of pythons in those areas of which we are aware, on suitable habitat, elevation and routes of dispersal, and on the comments of authors specifically describing the range of pythons in those peripheral areas.

The map of the range of *Python bivittatus*

The distribution of *P. bivittatus*, as given in Rodda et al. (2008), is shown by the eastern portion of their map (Figure 1). East of the Himalayan Mountains the range of *P. bivittatus* extends across southern China. The northern limits of this expanse have only been generally described and mapped. Prior to 1986 in China, and 1992 elsewhere, all authors described the species as being restricted to extreme southeastern China, from southern Yunnan east to Fujian.

The English-speaking world became aware of records of the species in Sichuan from Zhao and Adler (1993); in the account for *P. bivittatus* they included "Sichuan" listed as a locality separate from the described range without other details. The Sichuan reference refers to two published reports (Liu, 1986; Zhao, 1987); these reports are in Chinese, and generally have been overlooked (see Barker and Barker [2010] for partial translations). Some texts, but not all, that followed include Sichuan in the written description of the Chinese range of *P. bivittatus*, most notably McDiarmid et al. (1999), Zhao et al. (1998), and Ji and Wen (2002). Ji and Wen (2002) included a roughly drawn map in which the range of *P. bivittatus* extends northward to the level of the southern boundary of Sichuan. Other maps, such as O'Shea (1998), Henderson and Murphy

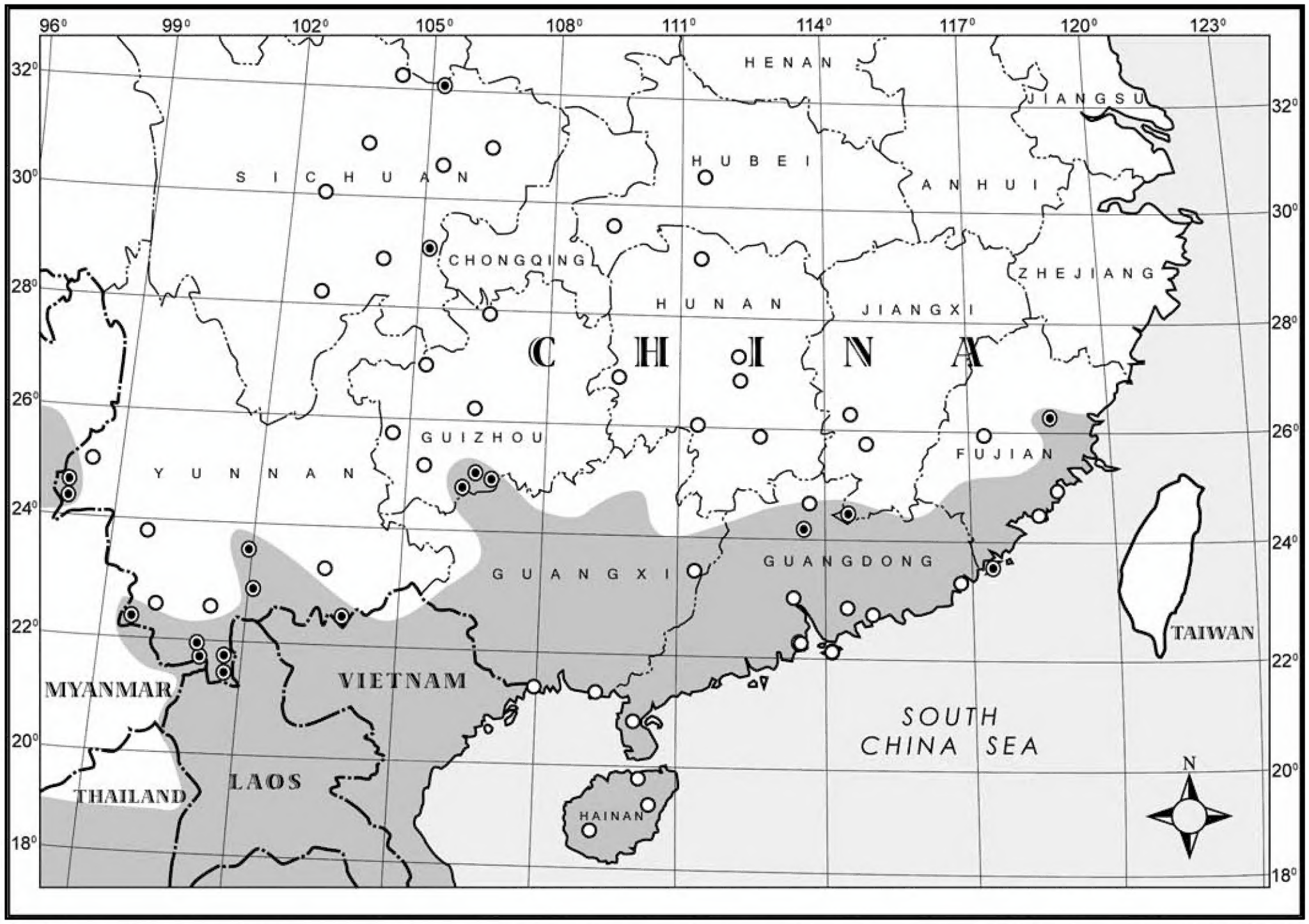

Figure 4. The shaded area denotes the range of *Python bivittatus* in China and adjacent countries. The black-centered circles denote published localities of *Python bivittatus*. The open circles denote the locations of the Chinese weather stations in the data set of Rodda et al. (2008) and Reed and Rodda (2009). Note that 27 of the weather stations from which these authors used data lie outside the range of the species.

(1997) and Kabisch (2002) correctly do not incorporate Sichuan into the distribution of *P. bivittatus*.

As drawn, the map of Rodda et al. (2008) more than doubles the area of the range of *P. bivittatus* in China illustrated in any other map. In response to this publication, Barker and Barker (2008a) published a more detailed map representing the probable distribution of *P. bivittatus* (Figure 3).

The map in the USGS report

For the USGS report, Reed and Rodda (2009) elected to use the exaggerated map and the associated climate data created for Rodda et al. (2008). They defended the action to disregard the map of Barker and Barker (2008a) with the following statement in Chapter 4, Subsection 3.1: "Associated with a call for unrestricted importation, Barker and Barker (2008a) argued for a more restricted distribution, partially relying on non peer-reviewed or unpublished information about current distributions." We have no idea as to what the first half of this sentence refers—no "call for unrestricted importation" is found in that paper, nor does that correctly portray our beliefs or public stance on the matter. This appears to be an attempt to call into question our reputation, and by inference the validity of our methods. With regard to the second half of the sentence, our research included most references cited in Rodda et al. (2008) as being the basis of the exaggerated map, plus others. The reference to "unpublished information" apparently refers to data we received from Kraig Adler, Indraneil Das, and Romulus Whitaker, all respected authorities on Asian herpetology. We note that among the 40 references on which the exaggerated map is based, one is incorrectly cited [Deyang (1986) = Liu (1986)], several are not peer-reviewed (Caras, 1975; Whitaker, 1978; and probably Pope, 1961; Minton and Minton, 1973; and McKay, 2006), one is apparently overlooked (McKay, 2006), and one is curiously irrelevant [Vinegar et al. (1970) offers only a review of other citations and adds nothing other than a very general map].

The recent publication of Barker and Barker (2010) amends and further delimits the range of *P. bivittatus* in China (Figure 4) with arguments for the exclusion of the Sichuan localities as being irrelevant to the natural distribution of the species.

Elevation

We question the generally accepted altitudinal limit of 2000 m that is often published for *P. molurus* and *P. bivittatus*. Rarely is any reference or citation made for the source of this figure. We believe that the original source of this limit can be credited to Wall (1921). The exact statement of Wall is as follows: "It is a denizen of the plains, but ascends into hills, on rare occasions, I believe up to about 6,000 feet." This is an

anecdotal statement, not based on locality records or specimens. Wall does not specify where pythons are found at this elevation, as was reported by Murphy and Henderson (1997).

Most subsequent published accounts of the species do not list an altitudinal limit for the two taxa (including Smith, 1943; Taylor, 1965; Daniel, 1983; Zhao and Adler, 1993). Pope (1935, 1961) and Murphy and Henderson (1997) list the maximum elevation as 6000 feet, referenced to Wall (1921). Pope (1935) does not report python localities in China at 1500+ m, as incorrectly reported in Reed and Rodda (2009)—he reports elevation in "feet," not "meters." In some accounts where maximum elevation is included in metric, the 6000 ft limit has been converted to 2000 m; we are not aware of any reference that has been provided for that figure (e.g., Whitaker, 1978; Khan, 2002; Whitaker and Captain, 2004; Kabisch, 2002). Zug and Ernst (2004) cite an altitude maximum of 2400 m without reference to locality or specimen. Whitaker (1993) states that in undisturbed areas *P. molurus* may ascend to 2500 m, but does not provide localities or specimens for reference. Shah and Tiwari (2004) state that *P. bivittatus* has been observed at 2800 m, but do not provide localities or specimens for reference.

We can find no basis for the statement of Reed and Rodda (2009:50) that "some of the highest elevations in their native range are located at the highest occupied latitudes of their native range. . . ." This statement is unfounded and apparently included to support the fact that when creating their data set they selected weather stations at the highest elevations in the highest latitudes without regard for the presence of pythons.

In our review of the literature, we find only one record that exceeds 1000 m for *P. molurus*. Hutton (1949) records an observation of *P. molurus* at an elevation of 5500 ft (1676 m) in the High Wavy Mountains. This locality is in the state of Tamil Nadu in southern India at approximately 10°N latitude.

A second report of a possible high locality is that of Morris (1933) of a python killed in the Nagiri Hills "near Kotagiri"; Kotagiri, located at about 11°N latitude, is at 1800 m, but two kilometers to the south is a valley that quickly descends to 500 m.

Even at southern and tropical latitudes, pythons apparently are not common at high elevations. We note the report of the Oxford Survey where more than 100 person-days of herpetofaunal survey in the Western Ghats of western Tamil Nadu at 9.30°N latitude at elevations of 910–1690 m failed to find any pythons (Anonymous, 1987). Kabisch (2002) lists the elevation maximum in Nepal as 550 m.

We are aware of three records for *P. bivittatus* that exceed 1000 m. The localities of Luchun, Yunnan, China, and Ziyun, Guizhou, China (Zhao et al., 1998; Barker and Barker, 2010), are both at elevations of 1100 m. The highest record is 1200 m, reported by Orlov et al. (2000) on the Tam-Dao Mountain Ridge in northern Vietnam; we note that the maximum elevation of the study site was 1500 m, but pythons were never observed at that elevation. All three localities are in areas where significantly lower elevations are nearby.

The problem with noting "maximum elevation" is not necessarily the elevation—it is where the elevation is located. We know from their maintenance in captivity that neither *P. molurus* nor *P. bivittatus* suffer metabolic or physiologic problems due to reduced atmospheric pressure or lower oxygen levels at 2000 m elevation. The problem pythons face in nature at high elevations is that it is cold up there, and it becomes substantially colder the further north one progresses.

It is reported by Harvey et al. (2008) that *P. bivittatus* is capable of moving significant distances—exceeding 50 miles—in about three months. In nature there are many areas where *P. molurus* and *P. bivittatus* are found where a lateral migration of only 1 km can mean an elevational change of 1000 m or more. This calls into question the presence of pythons at elevations of 500–1000 m and higher as evidence that those snakes are resident at those elevations if lower elevations are nearby. This also calls into question the actions of the authors to use data from weather stations at elevations in excess of 500 m without records of pythons in the near vicinities of those weather stations and evidence that those pythons are in permanent residence in those localities. To have done otherwise is evidence of a bias based on their unproven and incorrect a priori assumptions.

To summarize, 2000 m elevation at the equator is a very different climate than 2000 m in the state of Jammu and Kashmir in northern India. To state that the elevation maximum for a widespread species is 2000 m doesn't mean that everywhere in the distribution that elevation would be suitable. It means that at some particular place within the range of the species, someone witnessed or collected a specimen at that record elevation. In this study in particular, to have chosen weather stations at excessively high elevations at high latitudes in the absence of any records, specimen or sightings of pythons at any of those locations is completely irresponsible.

The data set of Rodda et al. (2008) and Reed and Rodda (2009)

The file we received is an Excel spreadsheet. It has 189 lines and 49 columns. Scattered though the file are lines that are referenced to a country, province or region where Burmese pythons naturally occur, with a literature citation on which the localities are based. The bulk of the file is the 160 lines that are records for weather stations at specific localities supposedly within the natural distribution of *molurus* and *bivittatus*. Two records are for weather stations in Florida, one is for Borneo, and eight have incomplete data. There are 149 lines of complete data; we consider each line as a record. The 149 records are from 11 countries.

The 149 records can be divided into the following categories: There are 88 records from weather stations that are clearly intended to represent the range of *P. bivittatus*, and 50 records that can be clearly assigned to *P. molurus*. There are 11 records of weather stations in Bangladesh, northern India and Nepal at localities where either or both taxa might be present.

Locality matching

It is stated in Rodda et al. (2008) that when possible, specific reported localities for pythons are matched to a weather station in the same 1-degree latitude/longitude cell. Each record has two spaces for the map coordinates for python localities to which

the weather station is matched. However, only 7 records of the 149 in the data set contain map coordinates referring to python localities, and three of those are either approximate or incomplete. In other words, 145 of the localities (97.3%) selected by the authors are not based on actual python records.

Problematic weather station locations

We mapped out the locations of the 149 weather stations. A substantial number of weather stations are located outside the distributions of the two species.

In the area of the range of *P. molurus* in the Sindh Province of Pakistan, we find that three of the five weather stations, 60%, at Chor, Jacobabad and Padidan are clearly outside the range depicted in Figure 2. In Figure 1, Padidan would be located at the northern margin of the range in the Sindh, and Jacobabad remains distinctly outside the range depicted by Rodda et al. (2008). In the data set, Padidan is identified as being in Nawabshah District—in fact it is in Khairpur District and outside the reported range of *P. molurus* (Minton, 1966; Khan, 2006).

There is a notation in the data set that the Jacobabad locality is based on a specimen in the California Academy of Science collection collected by J. A. Anderson. A search of the museum collection of the CAS finds one specimen of *P. molurus* from Pakistan, deposited in 1965 by J. A. Anderson—however it was collected at Sujawal, not Jacobabad. Sujawal is in the delta region on the east side of the Indus in the lower reaches of the drainage and well within the range of the species in the Sindh.

Chor, in northeastern Thar Parkar District is in sand dune desert, and seems an unlikely locality for pythons. Pythons in southern Pakistan are found in small, scattered localities with restricted mesic conditions not typical of the sand dune deserts of northeastern Thar Parkar. Randomly located weather stations in such areas of environmental extremes do not correctly reflect the conditions of microclimate required by pythons.

Eight weather stations in the data set are found from the area of the Punjab Districts of Pakistan and India, then north through Himachal Pradesh and into the Jammu Province. Of these, four (50%) lie outside the ranges as depicted in both Figure 1 and Figure 2. The problem locality farthest to the northwest is the weather station at Murree (2126 m elev.), located about 40 km northeast of Islamabad. East and slightly north of Murree is the weather station at Srinigar (1585 m elev.) located in the Kashmir Valley north of the Pir Panjal Range of mountains (4000 m to 6221 m). South in Himachal Pradesh is the weather station at Simla (2205 m elev.), in the mountains on the eastern edge of the Tibetan Plateau. All three of these extralimital weather stations are high latitude, high elevation and very cold. There is no evidence that pythons occur anywhere near them. The fourth problematic weather station is at Multán, Punjab, Pakistan. Multán is located along the lower stretch of the Chenab River at the southern end of the Thal Desert; the locality is extremely hot and dry and there are no records of pythons.

In the northern Indian state of Uttarakhand, just to the west of Nepal, there is one weather station in the data set in the Kumaun District at Mukteswar (2310 m elev.). About 80 km to the west of Mukteswar is Corbett National Park, the westernmost known locality for *P. bivittatus* (Barker and Barker, 2008a). The pythons are found there at elevations of 250–500 m. At 2310 m of elevation, there are no records or other evidence of pythons near Mukteswar. It is an extremely high elevation and extremely cold.

There are six weather stations in Nepal. Three (50%) are outside the range of the species in both Figure 1 and Figure 2. The stations at Pokhara (833 m elev.), Kathmandu (1337 m elev.), and Taplethok (1372 m elev.) all are north of the ranges drawn along the terai of Nepal in both maps, and two of the stations are more than double the elevation of the maximum record in the country of 550 m (Kabisch, 2002). Again, these weather stations are too high, too cold, and not even in the range of the species that are the subject of the study.

There is a data set record for a weather station in Darjiling (2127m ele.), just to the east of Nepal, where the state of West Bengal rises to contact Sikkim in the area between Nepal and Bhutan. About 20 km away there are more suitable elevations of 200–300 m in the Teesta [Tista] River drainage that flows south to the Brahmaputra River. We can find no records that pythons naturally inhabit Darjiling or have ever been found at that elevation anywhere in northern West Bengal.

The Pakistan bias

There is a strong bias in Pakistan and western India for weather stations that are located in areas with low annual precipitation and that are extralimital to the range of *P. molurus*. The nine driest weather stations out of the total of 149 in the data set are, in order of driest first: Jacobabad, Sindh; Padidan, Sindh; Multán, Punjab; Hyderabad, Sindh; Chor, Sindh; Karachi, Sindh; Sahwal, Punjab; Bikaner, Rajasthan; and Jodhpur, Rajasthan. Of these weather stations, five are extralimital to the range of *P. molurus* in Figure 1 (56%); those being Jacobabad, Padidan, Multán, Bikaner, and Jodhpur. One additional weather station is extralimital to Figure 2, Chor—in other words, 67% of the driest weather stations in the data set are located outside of the range for the species.

The China bias

The data set includes 43 weather stations in China. Of these, 27 (63%) lie well outside the range of *P. bivittatus* illustrated in Figure 4. Perhaps even more surprising is that 11 weather stations lie distinctly outside of the range as described in Figure 1.

Regarding the Chinese weather stations: all Sichuan localities should be considered extralimital (Barker and Barker, 2010). No pythons are recorded from Hubei Province, yet two Hubei localities are sources of weather data; no pythons are known from Hunan, but there are five Hunan weather stations in the data set that contribute to the analyses. In Jiangxi Province, both weather stations are outside the range as illustrated in Figure 4.; one is outside the indicated range in Figure 1.

The bias in China is for weather stations in high, cold places where there are no records of pythons. In Yunnan there are Tengchong (1648 m elev.), Lancang (1500 m elev.), Simao (1500 m elev.), Lincang (1520 m elev.) and Mengzi (1301 m elev.). In Gizhou there are Pan Xian (1527 m elev.), Tongzi

(972 m elev.), Guiyang (1071 m elev.) and Xingren (1379 m elev.).

In the record for Leibo, Sichuan (1475 m elev.), Rodda et al. (2008) insert a comment into the data set that it's "doubtful that the station is occupied" [by pythons]. For Nanyue, Hunan (1309 m elev.), the authors inserted "lowland adjacent occupied" and "Siberian winters." The nearest records for *P. bivittatus* are hundreds of kilometers from these localities; apparently even the authors had doubts on the validity and relevance of data from these stations because of the elevation and latitude, yet this data is included in the data set and then used in all analyses and assessments. By including these cold temperature data from extralimital sites, Rodda et al. (2008) inflated their numbers of cool and temperate climate-spaces, and the climate match that followed thus included much more of the southern U.S. than is reasonable.

Additional problems and oversights

Mapping the coordinates of the weather station identified as "Telukbetung, Beranti" shows that this reporting station is located in Sumatra. *Python bivittatus* does not occur in Sumatra.

Similarly, the coordinates for the weather station identified in the data set as "Sumbawa" are such that the reporting station is on the neighboring island Lomboc.

It is reported that *P. bivittatus* are on Bali (McKay, 2006) but this island was not included in the range on the map created by Rodda et al. (2008).

In summary: 29 of the 88 records (33%) that refer to *P. bivittatus* are based on extralimital weather stations. Eleven of the 50 records (22%) that refer to weather stations in the range of *P. molurus* are extralimital to the range of the species. Of the total 149 records in the data set, 43 records (29%) refer to weather stations that lie outside the ranges of the two species.

Comments and conclusions

The map of Rodda et al. (2008) was the basis for all analyses, assessments, conclusions, and recommendations drawn from that paper and the USGS report that followed (Reed and Rodda, 2009). Despite the critical importance of the map to the study, the scholarship behind it is poor, and constitutes either careless disregard or purposeful exaggerations in every area of the range that could be open to interpretation.

Such variations in this map that differ from other published depictions are drawn with little or no regard to actual specimens and localities, suitable elevations, suitable habitats, routes of distribution, or other sound zoogeographic bases. The data set is error-filled, and padded with inappropriate data records. An unexplainable 29% of the weather stations in the data set do not lie within the geographic boundaries of either python species and many weather station localities far exceed reasonable limits of habitable elevation. The authors didn't even go to the effort of restricting their weather station locations to within the boundaries of their own exaggerated range map.

This report has been held up in the highest legislative committees and touted as all the "science" necessary to enact the addition of nine species of constricting snakes to the Injurious Wildlife List of the Lacey Act. Quite frankly, this report is an example of the inadequate editorial protocol of the USGS and an insult to the credibility of the USGS. The U.S. Fish and Wildlife Service and the National Park Service paid biologists in the USGS a large sum of money to create this report, and both these agencies, to say nothing of the American taxpayer, are thus owed a high quality and credible report.

One has to look no further than the deep-sea oil leak crisis in the Gulf of Mexico so see how the Department of the Interior, the Senate, and the Administration have problems getting good and truthful reports and data from government agencies—this USGS report of Reed and Rodda is yet another glittering example. This report is unacceptable because the data set on which all calculations and assessments are based is unsound.

Acknowledgments

We thank Jim Kirk, Michael Cota, Michael Dloogatch, Mark O'Shea, Bosco Chan, Romulus Whitaker, John Archer, and the staff of the Field Museum of Natural History for information and translations that contributed to our understanding. It is our hope that individuals with experience and knowledge regarding the distribution of the Burmese python, *P. bivittatus*, and the Indian python, *P. molurus*, will contribute to correct errors and omissions we may have committed. We welcome all comments and information that will improve the map and our understanding of the distribution of these species.

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What You Missed at the May Meeting

John Archer
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I was talked into being master of ceremonies at last October's Midwest Herpetological Symposium. I think it's because I'm so good looking, but there could have been another reason, such as no one else wanted the job. If you weren't there, you missed many really good speakers, but as often happens, one speaker was going over the allotted time. This is always a problem when you have so many speakers scheduled. I suppose doctors have the same type of problem when scheduling patients. One late or long appointment and their schedule is shot. As the speaker continued, I was beginning to wonder how I was going to repair the schedule when Danté Fenolio quietly approached me and offered to shorten his talk to get us back on schedule. I had previously met him but had no opportunity to get to know him. As it developed, his thoughtful offer wasn't needed and he delivered a terrific presentation, but that totally unsolicited offer cemented my admiration for Dr. Fenolio. When the CHS needed someone to host him on his visit, I quickly volunteered. I assumed he'd be the sort of person with whom I'd like to associate, and I was absolutely correct.

Photograph of Danté Fenolio by Dick Buchholz.

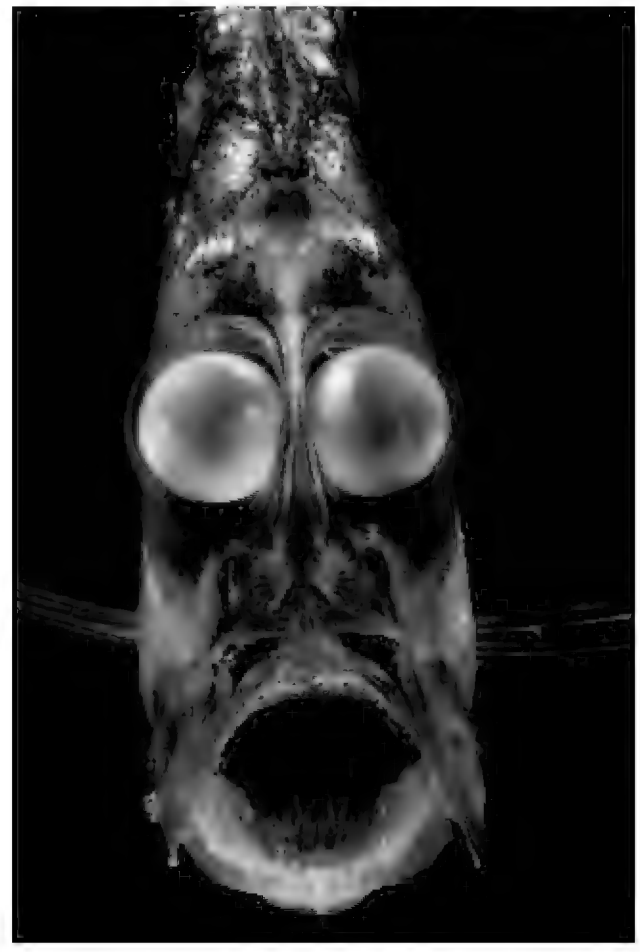
His credentials are impressive. He grew up in northern California, took his undergraduate degree at Oklahoma University, his masters from Arkansas State, and a doctorate from the University of Miami. He was hired by the Atlanta Botanical Gardens as head of their conservation department and has worked all over the world, including Latin America, Africa, Japan, and Russia. He is an expert on cave animals, an accomplished and frequently published photographer, and a frog aficionado. He has one of the coolest main pages for his web site, with an address named for one of the coolest frogs: www.anotheca.com. He has some interesting posts about his trips and some spectacular examples of his photography, along with lists of some of his extensive publications and, like so many (all?) of our speakers, he is fun to hang with.

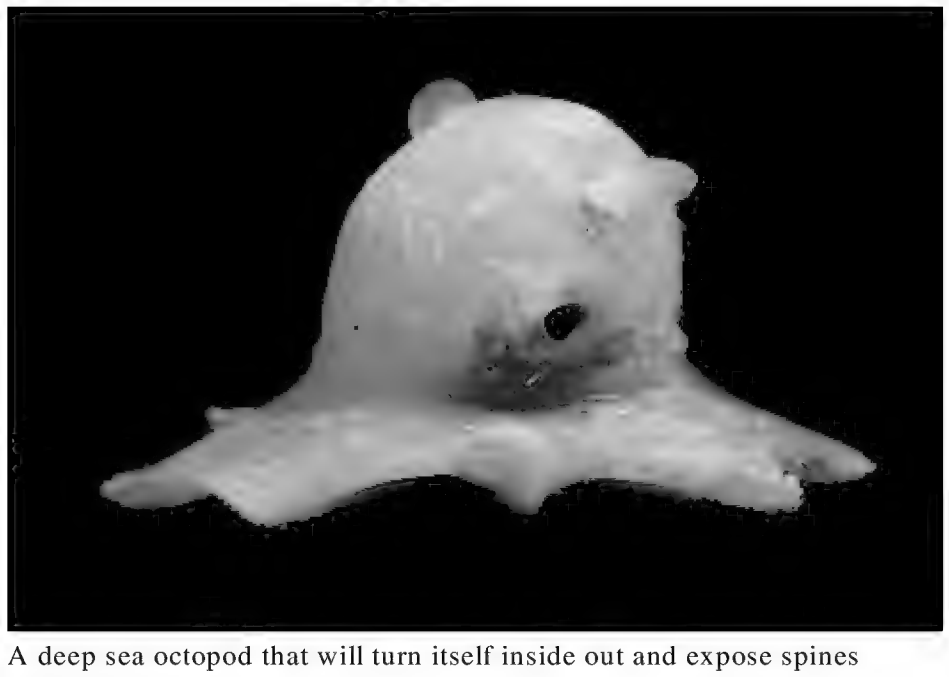
He had only recently returned from Santiago, Chile, where the Atlanta Botanical Gardens is setting up a captive-breeding program for frogs with the Santiago Zoo. With little time to rest at his home in Atlanta, he arrived in Chicago shortly after noon the day of our meeting and he had to leave the next morning on a 6:00 A.M. flight. I'm always grateful to our speakers, but this seemed above the average effort simply to speak to us. His one request was to photograph an isopod at the Shedd Aquarium. I spent the afternoon being a photographer's assistant while George Parsons, head curator at the Shedd, proved to be a gracious host as he gently wrangled the isopod into poses that Danté captured with superb skill. Me? I wiped the glass of the aquarium. Danté said I was one of the best glass-wipers with whom he'd ever worked. I'm putting that on my resumé.

As an aside, I'm a member of the Shedd, and I've consistently found them to be one of the city's friendliest institutions. In spite of being nothing more than Danté's driver, escort and glass-wiper, not only did George let me tag along to all the behind-the-scenes areas with Danté, but he and others of the staff went out of their way to show me neat animals, including the alligator snapping turtle that they have trained to recognize shapes! His keeper said that the training was easy. How cool is that? George even contributed two free Shedd passes to the CHS raffle. I keep saying that one of the best thing about belonging to this society is the people you meet, and George Parsons and all the people at the Shedd confirm that. Thank you all.

Steve Sullivan was good enough to have the projector in place and set up when we arrived at the meeting. Danté was skilled enough to hook up his computer (it really would be nice to have someone who was familiar with or could learn all the intricacies of electronic projection) and after a late start and a small amount of business, we were treated to "Life in the Dark," which Danté billed as a preview of his forthcoming book. I'm looking forward to purchasing it.

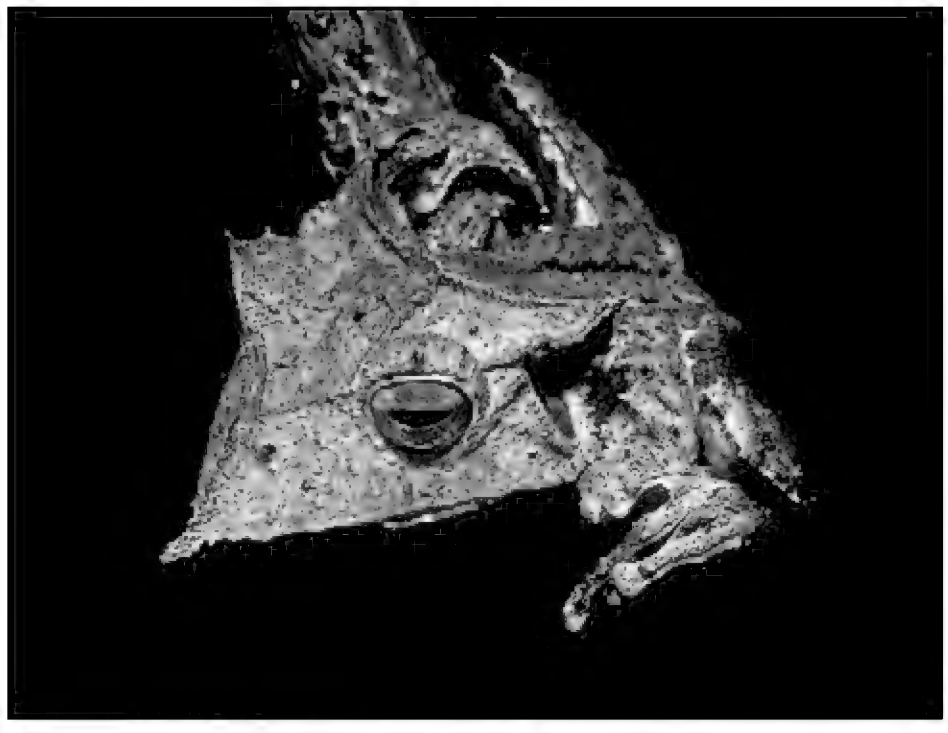
A head-on shot of a weird goggle-eyed fish adorned the title slide, giving us a hint that this wouldn't be an all herp talk. Not



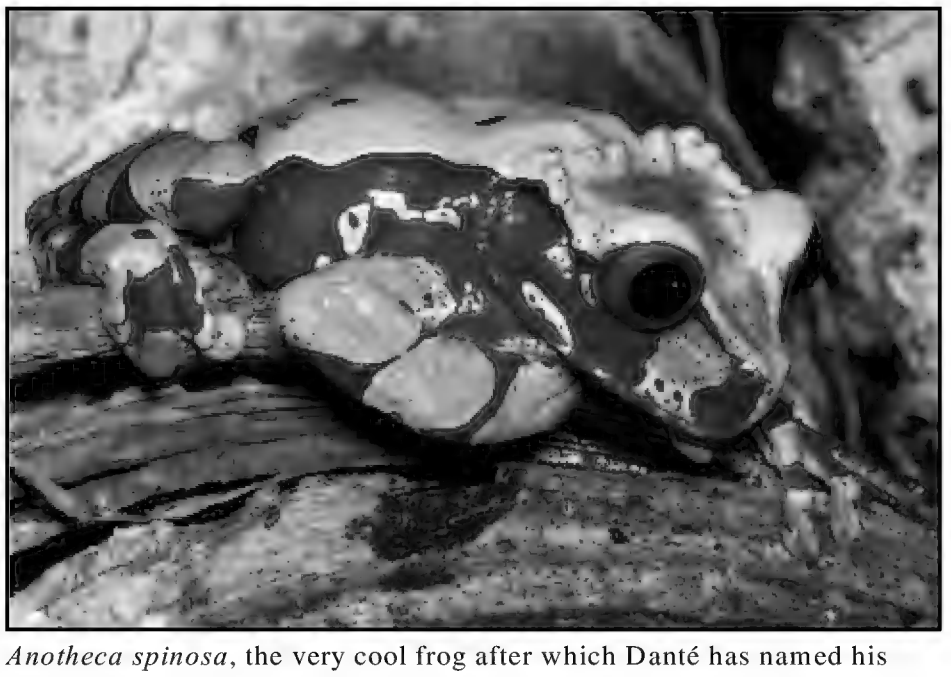


A deep sea octopod that will turn itself inside out and expose spines when threatened.

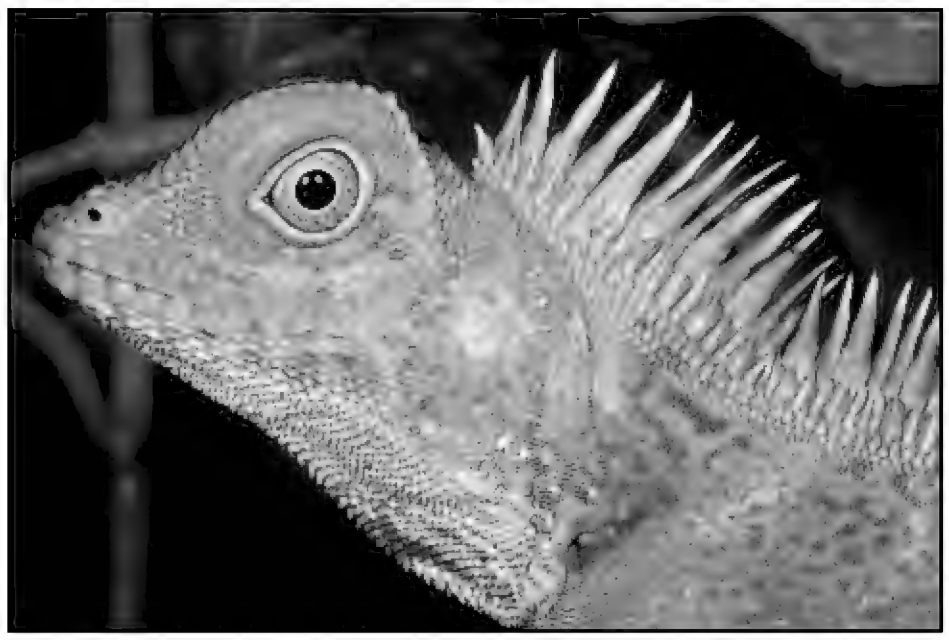
Looking almost proud to be alive.



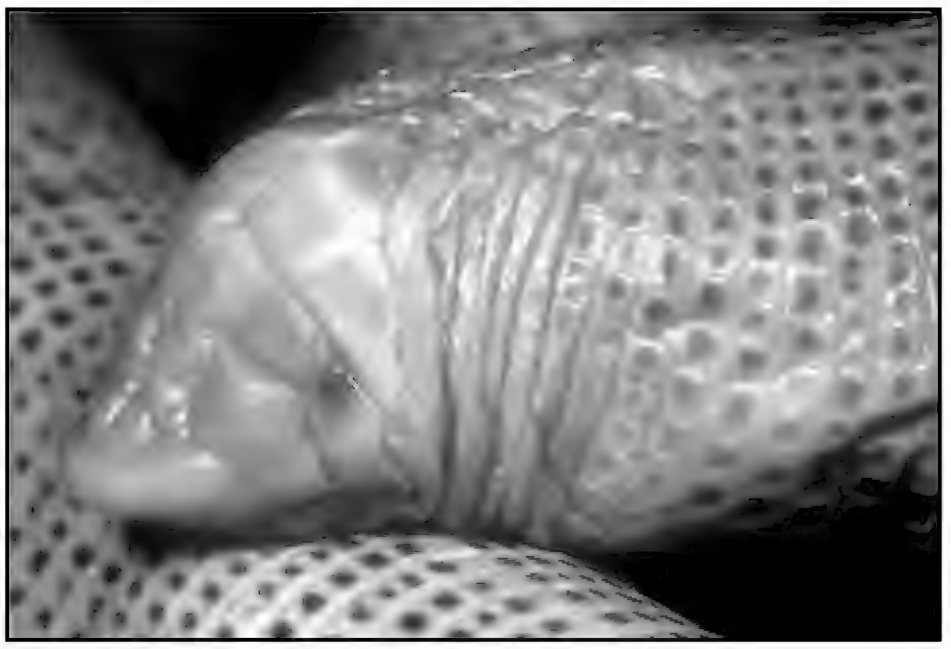
Frogs can be truly bizarre.



Anotheca spinosa, the very cool frog after which Danté has named his web site.



One of many creatures that one can approach more closely at night.



Close-up of an amphisbaenian.

that I cared. Dr. Fenolio's pictures brought to life animals that I know I'm never going to see in real life. The way some of them looked, I was fairly sure I didn't want to see them in real life. Danté's interest in the dark side of life developed when he began to realize how much you missed if you only went afield in daylight. Coupled with a lifelong interest in caves and excellent photographic skills, he began to build a gallery of creatures rarely seen and less often photographed. His talk included over 300 of those slides, and was organized by the types of dark environments.

He started with deep water. Extraordinary photos of exotic fish danced across the screen. DayGlo colors and bizarre shapes held our attention as Danté moved from the shallow ocean to the deeper ocean and from fish to cephalopods to octopods, including one that had two wing-like appendages on its head, sunken eyes, and spines along its arms which it revealed by inverting itself when threatened. He described the difficulties of capturing and photographing the truly deep-sea animals even on a research vessel, and mentioned how he was continually rejected as he asked to ride with Japanese fishermen until he thought to bring a case of beer with the request. More ghost-like but often really colorful animals filled our view, including an ostracod or seed shrimp looking closer to a jack-o-lantern than a shrimp, eyes glowing brightly in its round little body. Shell-less snails and amphipods that inspired the creature in the movie *Alien* shined on the screen. The latter wee beasties actually devour the innards of their prey and then live inside the transparent body. That's enough to give me nightmares. Danté showed us shrimp in primary colors and squid that resembled cockatoos and bite or had their eyes on long stalks. A snipe eel looked like a crane gone grotesquely wrong and there were fish that could telescopically eject their jaws to capture prey. Really deep dwellers had huge teeth and were often decorated with bright red luminescent spots.

Danté moved to fresh water and showed us photos of fish that looked as if their heads had been flattened with a shovel and tiny catfish that will burrow into the sides of larger catfish and consume them from the inside out. Another fish had a mouth that made it look like a horse's head and there was a surreal electric fish from the Amazon that had degenerate eyes. The Amazon River is pitch black about six feet below the surface because of the turbidity.

When Danté moved into the subterranean realm of critters, the photos actually gained some familiarity. Most herpers are probably familiar with cave salamanders and bats, but Dr. Fenolio had pictures of creatures more unusual such as web-spinning worms and endangered blind cave earwigs. I'm not really a fan of earwigs, but it's nice to know that someone is noticing them. He managed to engage us with pictures of ecosystems based on feces, a concept derided by many when first proposed. He's a good enough photographer that pictures of bat guano were interesting.

Ground water wildlife brought us pictures of animals looking like deep-sea creatures and familiar shapes like crawfish and salamanders. Pale pink blind cave fish, some with bizarre heads, represented the aquatic habitat of the underground.
Dr. Fenolio's slides of the nocturnal world brought photos of the most familiar animals to most of us, but his photography gave tree boas a new mystery and maternal bugs a new prominence. The darkness of the leaf litter was brightened by photos of fungi and brilliant centipedes, velvet worms and scorpions engulfed in the babies they carried on their backs. Originally from the northwest, Dr. Fenolio had to add a striking picture of a banana slug. A hand holding the subject showed us just how large a giant snail is. Then came the anurans, with Panamanian golden frogs and Houston toads, leaf frogs from South America and one of the stars of the Chilean breeding efforts, Darwin's frog.
His move into the low foliage included shots of colorful insects with unreal shapes and gorgeous butterflies. Switching to arboreal habitats featured cryptic bugs and bright frogs, including the frog his web site is named after, *Anotheca spinosa*. He had pictures of tadpoles of that frog with eggs inside their guts that the female lays just for their food. This sight led one early researcher to think that the tadpoles were producing eggs.
Bright blue alligator lizards and green vine snakes satisfied the squamate lovers among us. Moving to streamside nocturnal environments allowed shots of familiar and unfamiliar salamanders and frogs, and slipping into the waters featured shots of Lake Titicaca frogs and hellbenders, crocodilians and freshwater rays. Searching termite mounds brought a grotesque photo of a queen termite, gorgeous photos of blue caecilians, and close ups of amphisbaenians. The fossorial tour brought photos jammed with tiger salamanders, the blue belly of a Mexican burrowing frog, and the striking black and yellow of another caecilian. It's interesting to contemplate why many of these dark-loving animals are so brightly colored.

Exploring the darkness of the parasitic world (well, yeah, they live in the dark), Danté had pictures of a fungus sprouting from the husk of the bugs it had killed and botfly larva featuring the tiny spines that lock them into your skin. Interestingly, the fly lays its eggs on a mosquito. When the mosquito lands on a warm-blooded creature, the larva drops off and burrows into the skin, so the fly never delivers its egg directly to its host. Dr. Fenolio finished his talk with photos of the world of bio-luminescence, including squid pictures that looked as if they were artificially created by a pointillist painter and the only glowworm native to North America.

Here's the biggest problem with any presentation that includes such a large number of extraordinary photos. About half way through Danté's talk I realized that I was listening to his enrapturing monologue and not giving the pictures the attention I'd wish. I wanted to contemplate the beauty of his photography, but one presentation can only satisfy a small number of wants, and so I watched Dr. Fenolio's kaleidoscope of photographs flash across the screen and let his talk carry me to places I will never explore. I'm saving, and I'll be able to concentrate on the beauty of his photos when I purchase his book. Until we get that chance, visit his web site. Meanwhile, I will reminisce about an extraordinary day and an extraordinary talk.

Herpetology 2010

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

NEW SNAKE FROM CALIFORNIA AND OREGON

C. R. Feldman and R. F. Hoyer [2010, Copeia 2010(2):254-267] describe *Contia longicaudae*, a new colubroid snake from California and Oregon. Because *C. longicaudae* differs only subtly from the nominate species, *C. tenuis*, it has long been overlooked. However, genetic and morphological data readily distinguish *C. longicaudae* as distinct from *C. tenuis*. *Contia longicaudae* is genetically cohesive, possesses a greater number of caudal scales, a proportionately longer tail, and tends to be larger overall with more pronounced dorsolateral stripes and a more muted ventral coloration than *C. tenuis*. *Contia longicaudae* also occurs in more mesic and well-shaded habitats than *C. tenuis*. Both forms appear to be broadly parapatric throughout much of northwestern California, and a few areas of sympatry have already been identified, particularly in southwestern Oregon, but the two species have not yet been found syntopically. The authors' data also reveal additional structure within *C. tenuis*; populations from the southern Sierra Nevada Mountains form an incipient lineage that warrants further investigation. The genetic and morphological subdivisions identified here allow future evolutionary and ecological studies, and conservation efforts, to focus on distinct evolutionary units within *Contia*.

HABITAT FOR VIRGIN ISLANDS TREE BOAS

D. S. Harvey and R. J. Platenberg [2009, The Herpetological Journal 19(3):111-118] note that wildlife managers must often make conservation decisions based on uncertain and incomplete information. The challenge is to make the most robust predictions of species' requirements given these limitations. This is particularly the case when the species is rare and difficult to locate and baseline data are virtually nonexistent. In the absence of other data, the authors used 143 opportunistic observations collected over 25 years and geographical information systems to predict the habitat of the endangered Virgin Islands tree boa (*Epicrates granti*) on St Thomas, United States Virgin Islands. Habitat characteristics surrounding the observations were compared to the rest of the island using logistic habitat models with varying spatial resolution. Models formed with smaller-scale presence definitions were better able to discriminate areas of occurrence from the rest of the island but were more biased towards developed areas. To investigate habitat associations below the resolution of the models, microhabitat near high-certainty observations was compared with microhabitat at nearby, random locations. Snakes were disproportionately found in low elevation (<150 m) areas with non-stony soils. Vegetation near snakes consisted of woody plants 5–10 m tall with a high degree of vegetation continuity (e.g. mangroves, drought deciduous forests, thicket/scrub). This habitat occurs primarily along the southeastern coast of St Thomas. The multi-scale approach allowed a more informed prediction of the snakes' requirements than any single-scale approach, particularly in light of the variable resolution of the observations.

AQUATIC SALAMANDER DISPERSAL

C. M. Schalk and T. M. Luhring [2010, J. Herpetology 44(1): 104-109] note that research on landscape connectivity for amphibians that use isolated wetlands has focused on terrestrial and semiterrestrial species. Although aquatic species are commonly encountered in isolated wetlands, their dispersal capability and mode of dispersal has yet to be conclusively determined. For these salamander species, temporary waterways formed during heavy rains may provide transient dispersal opportunities among otherwise terrestrially isolated wetland patches and large contiguous sources (e.g., river swamps, lake systems). The authors assessed the vagility of two aquatic salamanders, the greater siren (*Siren lacertina*) and two-toed amphiuma (*Amphiuma means*), under three simulated environmental conditions: terrestrial (damp but no standing water); shallow standing water (1 cm of water); and complete submergence (approximately 5 cm of water). Salamanders were placed inside a modified Living Stream container and stimulated into moving through each treatment. Both species demonstrated a trend toward exhaustion for all treatments and failed to move more than 8 m in the terrestrial or shallow water treatments. As expected, animals in the fully submerged treatment were able to disperse the farthest. Physical characteristics of salamanders did not affect vagility. To disperse, these species likely rely on the formation of aquatic corridors during flooding events. Human activities that alter flooding events and watershed connectivity, such as flood control regimes and roads, may have important implications for wetland connectivity and, thus, metapopulation viability of aquatic salamanders.

BEHAVIOR OF HATCHLING COBRAS

B. A. Young et al. [2009, The Herpetological Journal 19(4): 185-191] note that spitting cobras are able to "spit" their venom even before they fully emerge from the egg, but little is known of how this behavior is manifested in hatchlings. This study examined three aspects of spitting behavior in hatchling red spitting cobras (*Naja pallida*)—the amount and dispersal of the spat venom, the kinematics of the head during spitting, and the distance of both the target and the spat venom. Hatchlings spit more venom relative to body mass than adult snakes, and produce similar patterns of spatial dispersal of the venom. Hatchlings exhibit cephalic oscillations during spitting that are similar to those reported in adults, although the magnitudes of these movements are more exaggerated in the hatchlings. Distance covered by the hatchling's spat venom is much less than that of the adult cobra, and, unlike the adults, the hatchlings routinely spit at targets well beyond their effective spitting range. These results suggest that while the same basic mechanisms underlie spitting in hatchlings and adults, these mechanisms undergo a distinct ontogenetic refinement leading to improved functional performance. Comparisons between the hatchlings and the adults led to the formation of a basic ethological model for venom spitting.

Unofficial Minutes of the CHS Board Meeting, May 14, 2010

The meeting was called to order at 7:45 P.M. at the Schaumburg Public Library. Board members Rick Hoppenrath and Lawrence Huddleston were absent.

Officers' Reports

Recording Secretary: Cindy Rampacek read the minutes of the April 16 board meeting and corrections were made. The minutes were accepted.

Treasurer: Andy Malawy presented the financial report for the month of April.

Membership Secretary: Mike Dloogatch shared the list of non-renewed memberships..

Publications Secretary: Aaron LaForge recently updated the speaker list on the CHS web site. He is still working on getting rid of the incorrect address that comes up for us on Google.

Sergeant-at-arms: Dick Buchholz reported that attendance at the April general meeting was 53.

Committee Reports

Shows (Jenny Vollman):
- Millennium Park Family Fun Time Event, June 12
- Cosley Zoo, June 19.
- Peggy Notebaert Nature Museum Picnic, June 27

Adoptions: Linda Malawy has had some crazy calls this month—many people calling who do not know what they own.

Old Business

ReptileFest: Rick Hoppenrath will report next month.

Wheeling survey: Jason Hood and Lawrence Huddleston have been out several times and have found the common species. Nothing terribly exciting but still good we were able to help. The project is ongoing.

Consensus of the board was that Tore's Italian Beef & Pizza worked well as an after-the-meeting restaurant. We will stick with it!

New Business

ReptileFest 2011 dates: We are currently looking at April 9 and 10. The board decided that we should raise admission rates next year.

Jason Hood will be the chair of the nominating committee.

Mike Dloogatch moved that we add the Chicago Herpetological Society as a signatory to David Lee's letter urging *Reptiles* magaline to adopt a more conservation-oriented editorial policy. Jenny Vollman seconded. The motion passed unanimously.

Round Table

Mike mentioned that there will be an ad in the May *Bulletin* stating that Henry Cohen will be selling his entire collection.

Jenny mentioned that Steve Barten will have an article in the International Reptile Conservation Foundation journal.

Deb was disappointed that none of us were at the Save the Frogs Day event.

The meeting was adjourned at 9:21 P.M.

Respectfully submitted by recording secretary Cindy Rampacek

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 12921 SW 1st Rd, Ste 107-434, Jonesville, FL 32669, 352-472-9189, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. Our mice and rats are vacuum-packed to greatly extend freezer life by reducing freezer burning and preserving vitamin and nutrient content. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. For a complete price list please visit our web site, www.themousefactory.com. We accept all major credit cards, PayPal or money orders. Call us **toll-free** (800) 720-0076 or send us an e-mail at info@themousefactory.com. Write us at PO Box 85, Alpine TX 79831.

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: Rats—live or frozen. I breed rats for my collection of boas so only top quality lab chow and care will do, I'm now offering surplus animals for sale. Located in far south suburbs of Chicago. Only orders of 20 or more please, no large rats will be available. For current availability and prices, please e-mail Steve at smuys@sbcglobal.net.

Herp tours: **The Ultimate Bushmaster Experience**: five days in and out one of the world's hotspots, the Atlantic Rainforest in Brazil, with safety and confort, and also some work in a captive breeding center, guided by a specialist in the genus *Lachesis*. Groups of six people. Please contact Rod Souza, M.D lachesisbrasil@hotmail.com

Herp tours: **Biodiversity of the Ecuadorian Amazon: September 19-28, 2010**. Join Biophoria Tours as we travel to the Shiripuno Research Center, one of Ecuador's most pristine and remote preserves in the Amazon. On this trip, our small group will focus on all the wildlife that the Ecuadorian Amazon has to offer. We guarantee this amazing trip will be one you never forget! For more information please email or call: Bryan Suson, (847)-344-9607. www.biophoriatours.com info@biophoriatours.com

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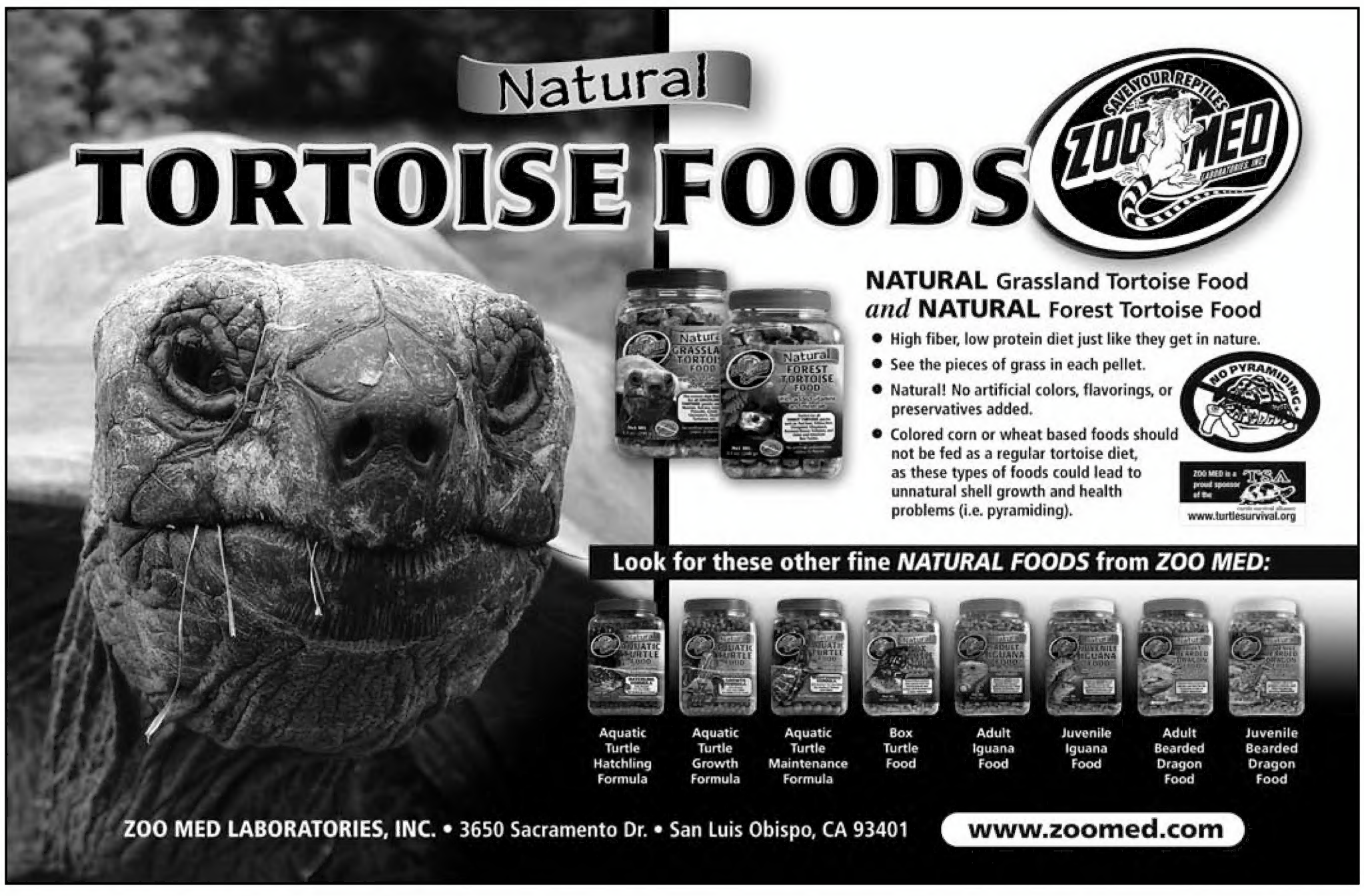
Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com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UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, June 30, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Age (yours) or commonness (the animal's) should not be a limitation. Guidelines for the occasion: don't bring venomous reptiles or endangered species, and please bring only amphibians or reptiles (this means no worms, tarantulas or other invertebrates).

Speaking at the July 28 meeting will be **Mike Pingleton**, of Champaign, Illinois. Mike is the author of *The Redfoot Manual: A Beginner's Guide to the Redfoot Tortoise*, and is a field herper extraordinaire.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

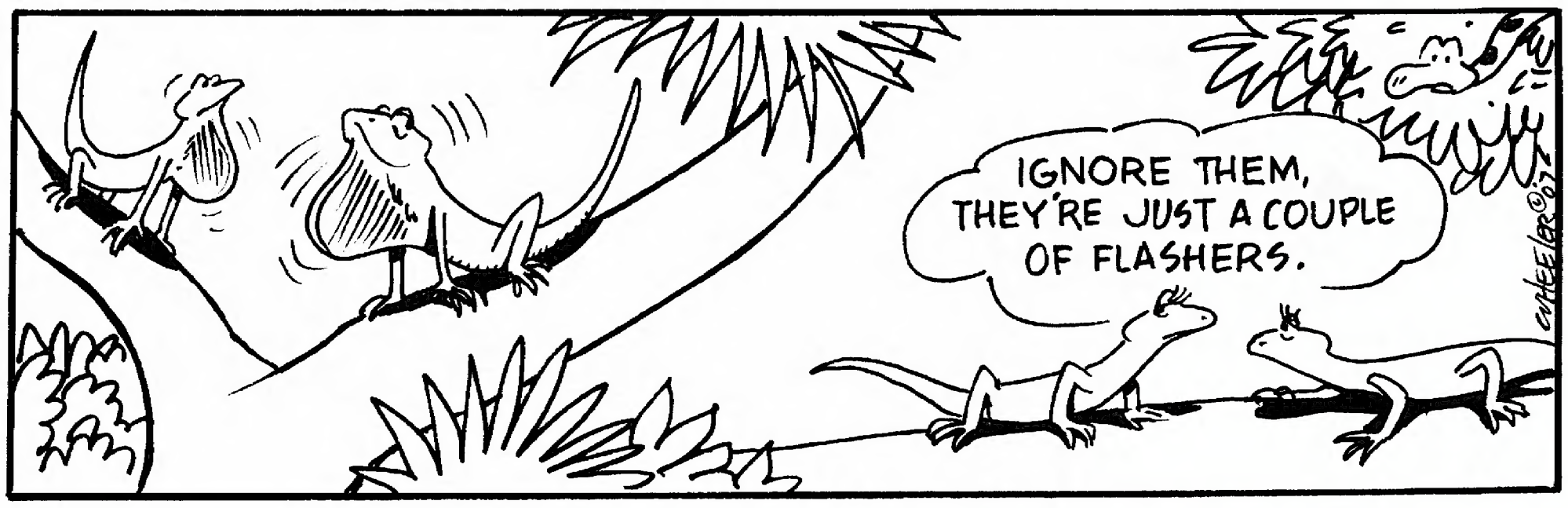
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to be held at 7:30 P.M., July 16, in the adult meeting room on the second floor of the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the CTC website: http://chicagoturtle.org/.

THE ADVENTURES OF SPOT



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